
Panasonic

Sanyo MCO-19M Service Manual

Multi-gas incubator

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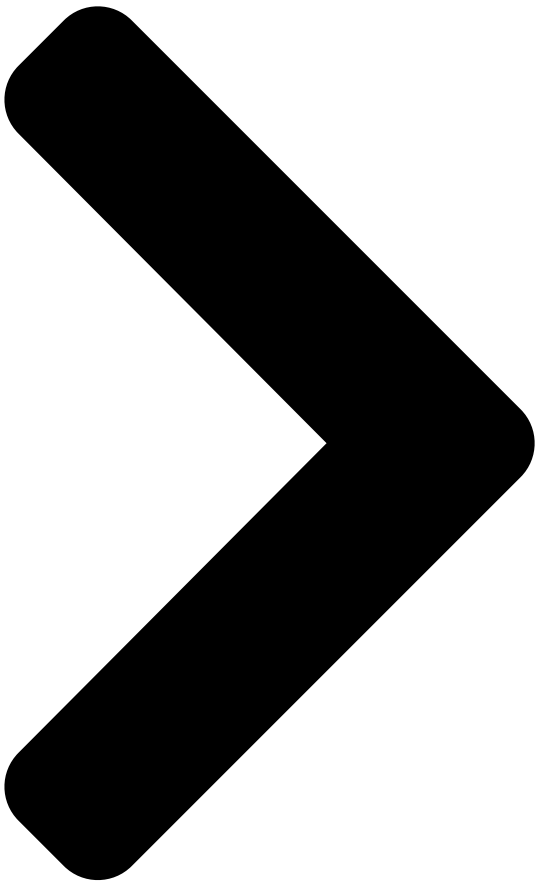

Service Manual

Multi-gas Incubator

MCO-19M

MCO-19M(UV)

FILE No.

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SANYO Electric Co., Ltd.
Biomedical Business Division

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Chapters

Related Manuals for Sanyo MCO-19M

Laboratory Equipment Sanyo MCO-19MUVH Instruction Manual

Multi gas incubator (78 pages)

Medical Equipment Sanyo EAC-1000B Brochure

Sanyo refrigerators and freezers brochure (4 pages)

Medical Equipment Sanyo MLS-3780 Usage Instructions

Autoclave (9 pages)

Summary of Contents for Sanyo MCO-19M

Page 1 Service Manual FILE No. Multi-gas Incubator MCO-19M MCO-19M(UV) SANYO Electric Co., Ltd. Biomedical Business Division SM9910245...

Page 2 Effective models This service manual is effective for following models. Name Product code Voltage and Frequency MCO-19M 823 633 51 115V 60Hz 823 633 54 230/240V 50Hz MCO-19M(UV) 823 633 71 115V 60Hz 823 633 74 230/240V 50Hz...

Page 3: Table Of Contents

Contents Page Specifications ---------- - Structural specifications - Control specifications - Performance specifications Dimensions ---------- Gas circuits ---------- Temperature calibration ---------- span calibration ---------- span calibration ---------- zero calibration ---------- Components on PCB ---------- Connections on PCB ---------- Electric parts ---------- Wiring diagram ----------...

Page 4: Specifications

Specifications Strucutural specifications Name Multi-gas Incubator Model MCO-19M MCO-19M(UV) External dimensions W620 x D710 x H900 mm Internal dimensions W490 x D523 x H665 mm Interior volume 162 L Exterior Painted steel Interior Stainless steel containing copper Outer door Painted steel...

Page 5 UV lamp replacement kit (MCO-20UV) Stacking spacer (MCO-18SB, when stacking on the MCO-175) Stacking spacer (MCO-21SB, when stacking on the MCO-20AIC) Ethernet (LAN) Interface (MTR-L03), RS232C/RS485 Interface (MTR-480) SANYO Data acquisition software (MTR-5000) 4-20mA Interface (MCO-420MA, USA only) - 2 -...

Page 6: Control Specifications

Control specifications Model MCO-19M MCO-19M(UV) Thermal sensor Thermistor Temperature display LCD digital display controller Microcomputer; Input by keypad density setting range: 0 Resolution; 0.1 Non-volatile memory density display LCD digital display (Resolution; 0.1) Water level detection Water level sensor Optic type...

Page 7 - 4 -...

Page 8: Gas Circuits

Gas circuits sensor sensor valve A valve valve B Filter inlet port inlet port Sample port (Front) - 5 -...

Page 9: Temperature Calibration

Temperature calibration Here is the explanation how to calibrate chamber temperature. Ex) When setting temperature is 37.0 and actual temperature is 36.5 Process Operation MENU Set thermal sensor at the center of the chamber and start the unit running. Leave it until chamber temperature is stable. Press MENU key in Top screen to call MENU screen.

Page 10: Co 2 Span Calibration

span calibration (Ex When setting CO density is 5.0% and actual CO density is 4.5%: Process Operation MENU Put densitometer thorough the sample port at the front side of the unit to measure chamber CO density. Tools Select Tools in the Top Screen. Select Tools (1/2) is displayed.

Page 11: O 2 Span Calibration

span calibration (Ex When setting O density is 5.0% and actual O density is 4.5%: Process Operation MENU Put densitometer thorough the sample port at the front side of the unit to measure chamber O density. Tools Select Tools in the Top Screen. Select Tools (1/2) is displayed.

Page 12: Co 2 /O 2 Zero Calibration

zero calibration Prior to commence calibration Make sure chamber temperature should be stabilized, CO sensor BOX temperature should be 45 ±2 , setting CO density should be 0.0% and setting O density should be 20.0%. Make sure there should not be left CO in the chamber.

Page 13 - 10 -...

Page 14: Connections On Pcb

CN12 #3 - #4: Hinge sub heater Control of hinge sub heater CN13 #1 - #2: Buzzer PCB CN14 UV lamp, ballast Option for MCO-19M Detection of water level in CN15 #1 - #3: Water sensor humidifying pan CN16 sensor...

Page 15: Electric Parts

10K ,25 CO2 BOX temp. sensor Type 103AT-1 103AT-1 Rating 10K ,25 10K ,25 Ballast Type EKF-04115B1 EKF-04115B1 (Option for MCO-19M) Rating 115V, 4W 115V, 4W UV lamp Type (Option for MCO-19M) Rating Glow starter Type FG-7P FG-7P (Option for MCO-19M)

Page 16: Wiring Diagram

Wiring diagram - 13 -...

Page 17: Circuit Diagram (Main / Lcd)

Circuit diagram <Main PCB> - 14 -...

Page 18 < LCD PCB > - 15 -...

Page 19: Control Specifications

Control specifications Temperature control (1) Setting range: 0.0 ~50.0 (Default setting: 37.0) (2) Automatic set temperature alarm High temperature alarm setting range: Set temperature +1.0~+5.0 (Default setting:+1.0) Low temperature alarm setting range: Set temperature -1.0~-5.0 (Default setting:-1.0) (3) Alarm delay time: 0~15 minutes (Default setting: 15 minutes) (4) How to set temperature In TopScreen, press MENU key and select Set to display Stand-by Setting screen.

Page 20 (2) Automatic set temperature alarm Setting range: Set temperature +/-1.0 ~+/-5.0 (Default setting: +/-1.0) When a chamber temperature deviates from alarm setting range, the digits displaying current chamber temperature will start blinking. The following message will be

displayed after an alarm delay time elapses. “Warning:High Temp”...

Page 21 (8) Err01: CO2 gas cylinder becomes empty If a chamber CO2 density is not increased in spite that a CO2 valve is left opened, the following message will be displayed. “Err01: CO2 Gas Empty” Buzzer will sound intermittently and remote alarm will be active. When an Automatic CO2 Cylinder Changeover System (MCO-21GC) is installed optionally, CO2 supply line will be automatically switched to another line.

Page 22 “Err18: UV Lamp Abnormal” Buzzer will sound intermittently and remote alarm will be active. Note) UV lamp is optional components (MCO-19UVS) for MCO-19M. (22) Notice of UV lamp life When UV lamp accumulation time expires approx. 1000 hours, the following message will be displayed.

Page 23 (23) Err19: O2 sensor is abnormal When a measured voltage in O2 sensor is abnormal, the following message will be displayed. “Err19: O2 sensor Abnormal” Buzzer will sound intermittently and remote alarm will be active. (24) Low humidifying water When a water sensor detects there is no water in humidifying pan, the following message will be displayed.

Page 24 Linkage between remote alarm and buzzer Setting of linkage between remote alarm and buzzer “0” --- Remote alarm is inactive by pressing BUZZER key. “1” --- Remote alarm isn’t inactive by pressing BUZZER key. Contact output Between N.O. and COM. Between N.C.

Page 25 Ring Back If BUZZER key is pressed to stop buzzer sounding during an apparatus is in alarm conditions, the buzzer will sound again after predetermined setting time elapses. (1) Setting range of Ring Back time 1~99 minutes (Default setting: 30 minutes), 0 minute --- Not Ring Back (2) Remote alarm and buzzer Linkage between remote alarm and buzzer Not linked (Default)

Page 26: Operational Specifications Of Lcd Panel

Operational specifications of LCD panel 1. Display descriptions <Top Screen> Turn the power switch on and Top Screen is displayed. Setting temperature: Digits in the right side of “Temp” The digits are displayed in reverse video when heater is active. Setting CO2 density: Digits in the right side of “CO2”...

Page 27 <Alarm display> High/low temperature alarm: When high/low temperature alarm is occurred and alarm delay time is not expired, digits of current chamber temperature display starts blinking. High/low CO2 density alarm: When high/low CO2 density alarm is occurred and alarm delay time is not expired, digits of current CO2 density display starts blinking.

Page 28 <Status of door> When an outer door is open, “Door : Open” is displayed in reverse video in the right side of Status field. When an outer door is closed, blank display. <Status of RH Pan> When humidifying water becomes empty, “RH PAN” is displayed in reverse video in the center of Status field. When humidifying water is fully filled, blank display.

Page 29 2. MENU key Press MENU key to display MENU or to activate MENU operations. <Automatic elimination of MENU key> When MENU key is displayed and there is no key operation for 1 minute, MENU key is automatically eliminated from the display. <Renewal of display>...

Page 30 3. MENU/Set - Various settings <Setting of chamber temperature> In Top Screen, press MENU key and select Set. Press ENTER key to display current setting temperature in the right side of “Temperature “ column in “Stand-by Setting” display. Input required value and press MENU key and select OK in reverse video. Press ENTER key to memorize the input value.

Page 31 <Key Lock> In Top Screen, press MENU key and select Set. Press ENTER key to display current Key Lock status in the right side of “Key Lock “ column in “Stand-by Setting” display. Select “OK” and press ENTER key to memorize the setting. “1”...

Page 32 <Display of Log> Data log for chamber temperature, CO2 density and O2 density are displayed by dot. 24 hours recording per page Display range: 5~50 for chamber temperature, 0~22.5% for CO2 density, 0~90.0% for O2 density Gradations: 5 for chamber temperature, 2.5 for CO2 density, 10 for O2 density Every press up shift key ( ) and down shift key ( ), it appears temperature display or CO2 density display or O2 density display in turn.

Page 33 - 30 -...

Page 34 HyperTerminal. (If the HyperTerminal is not available from the Start Menu, execute the following file: C:¥Program Files¥Windows NT¥hypertrm.exe.) In the HyperTerminal Window, set a new connection, the name (for example, Sanyo), connection settings, Method of connection, COM1, properties of COM1, and port.

Page 35 4. Various calibrations <Temperature calibration Temp/CO2/O2 Calibration > 1. In Top Screen, press MENU key and select “Tools”. Press ENTER key to display “Select Tools (1/2)” display. 2. Select ”Temp/CO2/O2 Calibration” and press ENTER key to display “Temp/CO2/O2 Calibration (1/2)”. Input actual measured value in the right side of “Temp Span”...

Page 36 <CO2 zero calibration / O2 zero carlibration CO2 Zero, O2 Zero > Turn the power on and set chamber temperature and set CO2 sensor box temperature in 45 and set CO2 density in 0.0% and set O2 density in 20.0%. Leave the apparatus until stabilized. Display “Temp/CO2/O2 Calibration”...

Page 37 <CO2 span calibration> 1. In Top Screen, press MENU key and select “Tools”. 2. Press ENTER key to display “Select Tools (1/2)” and select “Temp/CO2/O2 Calibration”. 3. Press ENTER key to display “Temp/CO2/O2 Calibration (1/2)”. 4. Input a CO2 measured value in the right side of “CO2 Span”. 5.

Page 38 <O2 span calibration> 1. In Top Screen, press MENU key and select “Tools”. 2. Press ENTER key to display “Select Tools (1/2)” and select “Temp/CO2/O2 Calibration”. 3. Press ENTER key to display “Temp/CO2/O2 Calibration (1/2)”. 4. Input a O2 measured value in the right side of “O2 Span”. 5.

Page 39 5. Various alarms <Setting of alarms> Setting range of high temperature alarm is +1.0~+5.0 Factory default: +1.0 Setting range of low temperature alarm is -1.0~-5.0 Factory default: -1.0 (Note) When you input a value lower than “1.0”, it is memorized as +/- 1.0 . When you input a value over than “5.0”, it is memorized as +/- 5.0 Setting range of high CO2 density alarm is +0.5~+5.0% Factory default: +1.0% Setting range of low CO2 density alarm is -0.5~-5.0% Factory default: -1.0%...

Page 40 <Alarm delay time> Setting range of both alarm delay time for high/low temperature alarms, and high/low CO2 density alarms is 0~15 minutes. (Factory default: 15 minutes) Setting range of high /low O2 density alarm is 0~30 minutes. (Factory default: 30 minutes) O2 density alarm will emit after twice of setting time elapses Note) Even if you input a value more than 15 minutes, alarm delay time will be set in 15 minutes.

Page 41 <LCD back color> When you input “1” in the right side of “LCD Back Color” column, the display back color is set in blue (Factory default). When you input “2” in the right side of “LCD Back Color” column, the display back color is set in white. Note) When you input a value except for 1 or 2, the display back color is automatically set in blue.

Page 42 <DAQ communication mode> DAQ communication mode is settable only when an optional MTR-480 is installed. When you input “0” in the right side of “DAQ Mode”, DAQ communication mode is set in “Local” which does not enable apparatus to control in remote. (Factory default) When you input “1”...

Page 43 6. Setting of UV lamp <UV lamp illumination time> UV lamp illumination time is settable in the apparatus which is installed UV lamp (optionally). Settable range of UV lamp illumination time is 0~30 minutes. (Factory default: 0 minute) Note) When you input a value over than “30”, UV lamp illumination time is automatically set in 30 minutes. If an apparatus is not set in UV lamp optional setting (“1”...

Page 44 Ex UV lamp illumination time is set in 5 minutes; Procedures MENU key In Top Screen, press MENU key and select “Tools”. Tools Press ENTER key and select “UV Setting” column in “Select Tools (1/2)” display. Press MENU key and select “OK”. Press ENTER key and input “5”...

Page 45 6. Setting of Key Lock - 42 -...

Page 46 <Key Lock password> Key Lock password will be changed by following procedures.

Input a current using password and input a new password for twice. The password for factory default setting is “0000”. Note) When you input a wrong password, audible alarm will sound for 1.5 seconds and “Wrong Password” will be displayed under “Current User Password”...

Page 47 7. Setting of Date and time <Setting of date and time> Ex How to set 6:45:38 p.m. on May 17 2010 Procedures MENU key In Top Screen, press MENU key and select “Tools”. Tools Press ENTER key and select “Date Time” in the “Select Tools (1/2)” display. Press MENU key and select “OK”.

Page 48 8. CO2 / O2 standard gas calibration - 45 -...

Page 49 <Setting of CO2 density for standard gas calibration> Setting of CO2 density for standard gas calibration (optional setting) Setting range is 0.0%, 4.0~21.0%. (Factory default: 5.0%) When you set “0.0”, CO2 using by standard gas will not be calibrated. Note) When you input a value lower than “4.0”, CO2 density for standard gas calibration is automatically set in 4.0%. When you input a value higher than “21.0”, CO2 density for standard gas calibration is automatically set in 21.0%.

Page 50 <Setting of O2 density for standard gas calibration> Step for standard gas calibration mode Current step in standard gas calibration is displayed. Status of unit Status of unit in standard gas calibration is displayed. Error message Error message is displayed. Message for operator When standard gas calibration mode is complete, the message is shown for an operator.

Page 51 <Standard gas calibration> - 48 -...

Page 52 - 49 -...

Page 53 Ensure to install an optional Automatic CO density Calibration Add-on Kit MCO-SG when standard gas calibration is done automatically. Note) “Standard Gas Calibration” display will not be appeared and a device will automatically return to Top Screen when you select “1” in “Std Gas Cal Function” column in the “System Configuration” display. Operational sequence for standard gas calibration Step CO2/O2...

Page 54 Ex. When both CO2 and O2 densities for standard gas calibration are set in 5.0%; Procedures MENU key In Top Screen, press MENU key and select “Tools”. Tools Press ENTER key to display “Select Tools (1/2)” display and press down shift key ( ) To display “Select Tools (2/2)”...

Page 55 9. Service code 1. In Top Screen, press MENU key and select “Tools”. 2. Press ENTER key to display “Select Tools (1/2)” and select “Svc”. 3. Press ENTER key to display “Password” display. Input “384” in the right side of “Password” column. 4.

Page 56 10. Setting of various optional components <Prior to setting each optional components> In “Select Tools Svc” display, select “System Configuration” and press MENU key. Select “OK” and press ENTER key to display “System Configuration”. <Setting of UV lamp function> Input a value in the right side of “UV Function” in “System Configuration” display. When you input “0”...

Page 57 <Setting of standard gas automatic calibration> Input a value in the right side of “Std Gas Cal Function” in the “System Configuration” display. When you input “0” in the right side of “Std Gas Cal Function”, optional standard gas automatic calibration is inactive. (Factory default) When you input “1”...

Page 58 11. UV lamp accumulation time <Display of UV lamp accumulation time> UV lamp accumulation time is displayed in the right side of “UV Life” in “Analog Calibration etc” display. When UV lamp accumulation time reaches 1000hours, it is displayed as 100%. When a displayed value is “53”%, UV lamp accumulation time is calculated as;...

Page 59 12. Adjustment of heater balance <Adjustment of balance in bottom heater> Bottom heater output value can be changed for the prevention of chamber condensation or when increasing chamber humidity. Setting range is “0~40”. (Factory default: “10”) Note) When you input a value over “40”, bottom heater output value is automatically set in “40”. <Adjustment

of balance in door heater>...

Page 60 13. Setting of H2O2 decontamination time <Setting of H2O2 decontamination temperature> An apparatus stands by for H2O2 decontamination until it reaches decontamination set temperature +/- 1.0 . Setting range is 37.0~48.0 . (Factory default; 45.0) Note) When you input a value lower than 37.0 , H2O2 decontamination temperature is automatically set in 37.0 . When you input a value higher than 48.0 , H2O2 decontamination temperature is automatically set in 48.0 .

Page 61 14. Hardware status Set temperature A value displayed in the “SV” row in the right side of “Temp” column Current chamber temperature: A value displayed in the “PV” row in the right side of “Temp” column PWM output for heater: A value displayed in the “PWM” row in the right side of “Temp” column Set CO2 density: A value displayed in the “SV”...

Page 62 15. Initialization of non-volatile memory Procedures MENU key In Top Screen, press MENU key and select “Tools”. Tools Press ENTER key to display “Select Tools (1/2)” and press MENU key to select “Svc”. Press ENTER key to display “Password” and input service code “384”. Press ENTER key to display “Select Tools Svc”...

Page 63 <Initial data in non-volatile memory> Data Initial Remark Set temperature 37.0 Set O2 density 20.0% Set CO2 density 0.0% Ring Back time 30 min. Temperature zero calibration Log interval 6 min. CO2 zero calibration Corrective coefficient CO2 span calibration Corrective coefficient CO2 sensor gas cell voltage 4000mV For CO2 zero calibration...

Page 64 16 H2O2 decontamination <Setting of H2O2 decontamination> Ensure first that UV lamp function and H2O2 decontamination mode are active. Select “System Configuration” in “Select Tools Svc” display. Press MENU key and select “OK”. Press ENTER key to display “System Configuration”. Ensure “1”...

Page 65 <Display in H2O2 decontamination> H2O2 misting time H2O2 resolution time (Note) UV resolution is commenced in the above display. Hardware status When “H2O2 Decon” blinks in reverse video, H2O2 is misting. When “Decon” blinks in reverse video, H2O2 is preserving. (H2O2 is not misting) UV resolution When “UV Resolve”...

Page 66 H2O2 decontamination Procedures MENU key Locate trays and humidifying pan to the position. Fill 6% H2O2 solution in optional H2O2 unit (MCO-HP). Connect the cable to the port in the inner rear wall and close both inner and outer door. Press H2O2 key for 3 seconds in Top Screen.

Page 67 - 64 -...

Page 68 <H2O2 decontamination mode> In Top Screen, press H2O2 key for 3 seconds to activate H2O2 decontamination mode. Note) H2O2 decontamination mode will not be active without presetting optional UV mode and H2O2 deconmination mode. - 65 -...

Page 69 <Forced completion of H2O2 decontamination mode (Step 3)> While the chamber temperature is warming up (Step 3), press MENU key to display “Abort” is active. Press ENTER key to display “H2O2 Decon Aborted” and H2O2 decontamination mode will be forcibly terminated. - 66 -...

Page 70 <Forced completion of H2O2 decontamination mode (Step 4)> While H2O2 misting (Step 4), press MENU key to display “Abort” is active. Press ENTER key to commence UV resolution and to display “H2O2 Decon Aborted” and H2O2 decontamination mode will be forcibly terminated. - 67 -...

Page 71 <Power failure during H2O2 decontamination mode> If power fails while H2O2 misting process (Step 4) or UV resolution process (Step 7), UV resolution will reset and repeat. If power fails while H2O2 misting process (Step 4), “Decon Failed” will be displayed and “Err35: Power Failed” will be displayed on the message bar.

Page 72 <Error message in H2O2 decontamination> (Note Only 1 error message is displayed even if multiple error messages are present. Error # Status Display Alarm Action Err 31 When H2O2 generator “H2O2 Decon System Error” Decontamination disconnected “Err31: H2O2 Unit

No Connect” mode aborts Err 32 When H2O2 solution has not...

Page 73 17 ROM version Procedures MENU key In Top Screen, press MENU key and select “Tools”. Tools Press ENTER key to display “Select Tools (1/2)” and press MENU key to select “Svc”. Press ENTER key to display “Password” and ROM version is displayed. Select “Cancel”...

Page 74: Prevention Of Contamination

Prevention of contamination In servicing for CO incubator, it is important to prevent from contamination. 1 More than 90% of contamination in CO incubator is caused by mold. Mold is a kind of true fungi, it has high increasing power under high temperature and high humidity. Accordingly, it is easy for mold to increase inside CO incubator.

Page 75: Specifications Of Sensors

Specifications of sensors Temp. sensor, Overheat protect sensor, CO BOX temp. sensor (Type:103AT-1) Temperature Resistance Temperature Resistance Temperature Resistance (k) (k) (k) 27.28 13.57 7.19 26.13 13.06 6.94 25.03 12.56 6.70 23.99 12.09 6.47 22.99 11.63 6.25 22.05 11.20 6.03...

Page 76 sensor 18.0 27.1 36.4 45.7 55.1 64.7 74.3 84.0 93.9 103.8 113.9 124.1 134.4 144.8 155.3 166.0 176.8 187.8 198.8 210.0 221.4 232.9 244.5 256.3 268.3 280.4 292.7 305.2 317.8 330.6 343.6 356.8 370.2 383.8 397.6 411.7 425.9 440.4 455.1 470.1 485.4 500.8...

Page 77: Mechanism Of Double Wavelength Ir Sensor

Mechanism for Double wavelength IR sensor Infrared ray Chamber Contrast wavelength IR sensor CO2 measured wavelength IR sensor 4.3µm Measured wavelength: 4.0µm Measured wavelength: Double wavelength (4.0 m adding to 4.3 m) can be measured simultaneously in this IR sensor. Higher accuracy can be obtained by comparing both of measured wavelengths constantly in the same temperature condition.

Page 78: Water Sensor

Water sensor This Incubator is equipped with a water level sensor for the humidifying pan. The sensor is set automatically when the humidifying pan is installed. Take care not to damage the sensor when removing or installing the humidifying pan. When the humidifying pan is removed (side view) Sensor When the humidifying pan is installed (side view)

Page 79: Parts Layout

H2O2 generator MCO-HL) MCO-SG) Option Humidifying pan Sensor BOX Cover is removed CO2 sensor Inner bottom UV lamp Option for MCO-19M Electric lock on door (Option) Electric lock on unit (Option O2 sensor Circulating fan motor Back side Access hole...

Page 80: Setting Procedures For Optional Components

Setting procedures for optional components Applicable for; MCO-19UVS, MCO-HL, MCO-HP, MCO-SG 1. How to access to optional components (1) Input of service code Operation Display ---- “Top Screen” Press MENU key. MENU “MENU” window Select “Tool” and press ENTER key. ENTER Select “Tool”...

Page 81 UV lamp lifetime to be shorted by heat emission from the UV lamp. 4) Consult a SANYO representative or agent for replacement of UV lamp. 5) UV lamp occasionally stays illuminating longer than the predetermined time for the compensation of reducing UV illumination which is caused by increasing UV lamp accumulation time.

Page 82 (2) H generator (MCO-HP), H Decontamination kit (MCO-HL) Installation Fill 80cc distilled water in MCO-HP. By using the cable enclosed, connect MCO-HP with the connector on the bottom right of the incubator. (See picture as below) Connector cap should be kept in safe place. Ensure 2 pins of MCO-HP should be aligned to the holes on the rear duct.

Page 83 Removal of MCO-HP on the way of decontamination Operation Display/Remark Turn the unit off and on. Power switch “H2O2 Decontamination” When ‘Warming up’ is displayed, press MENU To avoid the device turning back MENU key and select ‘about’ and press ENTER to resolution process, ensure to ENTER key.

Page 84: How To Install Uv Lamp Add-On Kit Mco-19Uvs

How to install UV lamp add-on kit (MCO-19UVS) Kit includes: 1 UV label (Unused for MCO-19M) 1 UV caution label 1 UV lamp 2 Glow ass'y 1 UV door switch caution label 5 Name plate 1 UV lamp cover 1 Ballast 6 Screws M4 4.

Page 85 8. Remote the 2 caps shown in Fig. 7. 6. Fit the duct to original position. Fit Glow Ass'y ( ) and Ballast ( ) Place the humidifying tray and set the humidifying tray cover as shown in Fig. 5. by using 4 screws ( ).

Page 86 Noise filter removing each cover White 9P Fig. 8 10. Labels layout Put each label on the specified place. Use the name plate of MCO-19M(UV) for MCO-19M. Name plate UV door switch caution label UV lamp caution label Fig. 9...

Page 87 11. How to set UV lamp lighting period T e m p 3 7 . 0 C O 2 5 . 0 % M E N U S e t L o g T o o l s S t a t u s M E NU C a n ce l S e l e c t...

Page 88 C a n ce l M E NU S e l e c t T o o l s S v c V e r . 1 . 0 0 M E N U S y s t e m C o n f i g u r a t i o n A n a l o g C a l i b r a t i o n...

Page 89 In Select Tools screen, select UV Setting and press MENU button. Select OK and press ENTER key to call UV setting screen. S e l e c T T o o l s (1 / 2) A l a r m S e t t i n g M E N U D e f a u l t...

Page 90: Installation Of H Generator (Mco-Hp)

Installation of H Generator (MCO-HP) Prior to use H Generator, ensure to check the following notes. After installation Make sure the condensing fan should be correctly installed to the position. Make sure the duct should be correctly mounted to the position. Make sure the H Generator should be fixed by 2 fixtures which are pointed in the picture and each fixture should be correctly mounted to the holes at the bottom of the duct.

Page 91: How To Install H

How to install H decontamination kit MCO-HL and Electric lock Parts enclosures Tools Screw (M4) Screw (M5) Philips Screwdriver Wrench (8mm) Cap (M4) Water proof Name plate Plate meeting Transformer Lock and key connector Caution label Connector (White, 3P) Mount transformer on plate meeting and secure with screws (M4) and connect each wires (red and brown) to the places as left picture specified.

Page 92 Connect connector for electric lock with connector (White, 2P) and fit to the angle. Fit the key to lower side of the door. Note Reuse screws to fit each parts. Connector (White, 2P) (2P) Electric lock should be secured by new screws (M5).

Page 93 Door opening should be less than 10mm Shut the door and ensure electric lock when electric lock activating. should be correctly functioned by using key. Electric lock is not active when the power is supplied. Ensure door opening should be less than 10mm when electric lock is active.

Page 94 <Layout for Name plate and Caution label> Put Name plate and Caution label on the following specified places. Name plate (For MCO-19M(UVH)) Caution label (For MCO-19M(UVH)) - 91 -...

Page 95: How To Install Roller Base Mco-18Rb

How to install Roller Base MCO-18RB 1. As shown in the figure,set the unit on the roller base so that its leveling legs can fit into the holes (4 holes) on the base. 2. Insert the fixture from the side to the front leveling leg. Secure the fixture with 2 screws Leveling leg - 92 -...

Page 96: How To Install Automatic Co2 Cylinder Changeover (Mco-21Gc)

(For MCO-19AIC/MCO-19M only) MCO-18AIC/18M/MCO-19AIC MCO-19M/MCO-18AC) Before mounting This kit is applicable to MCO-20AIC, MCO-18AIC , MCO-18M, MCO-19AIC, MCO-19M and MCO-18AC. Following procedure is necessary only when mounting to MCO-18AIC MCO-18M or MCO-18AC. valve assy tube band 1. Remove 2 tube bands on the CO valve assy and then remove the hose and capillary.

Page 97 3. Attach the tube L100 and fix the tube by the tube bands removed in procedure 1. Make sure the tube bands are fixed firmly to prevent gas leakage. Fix both ends by the tube bands tube L100 Fig.2 Mounting procedure 1.Disconnect the power cable and make sure that the unit is not supplied with the power.

Page 98 Fig.3-2 MCO-18AIC,MCO-19AIC valve B Tube X white valve A Main board supply line A Connector (yellow) supply line B Fig.3-3 MCO-18 MCO-19 valve B Tube X white valve A Main board supply line B Connector (yellow) supply line A Fig.3-4 MCO-18AC Tube X white valve B...

Page 99 Setting procedures for MCO-20AIC/MCO-18AIC/MCO-18M/MCO-18AC When use MCO-21GC(the automatic switcher of CO gas supply line), it is necessary to set in automatic gas switching mode according to the following procedures. Description of operation Indication after operation operated Turn the power switch ON. current chamber temperature...

Page 100 Operation check after installation of MCO-21GC (for MCO- -20AIC/MCO-18AIC/MCO-18M/MCO-18AC) After the installation of MCO-21GC is complete, check the operation according to the following procedures. Procedures Stop the gas supply from cylinder A and use only cylinder B. Turn on the power switch of MCO-20AIC/18AIC/18AC and set 37 and 0%. Check if the gas cylinder A is selected.

Page 101 Setting procedure for MCO-19AIC/MCO-19M When use MCO-21GC(the automatic switcher of CO gas supply line), it is necessary to set in automatic gas switching mode according to the following procedures. <Service code input> T e m p 3 7 . 0 C O 2 5 .

Page 102 <Setting of Automatic CO2 cylinder changeover system> M E NU C a n ce l S e l e c t T o o l s S v c V e r . 1 . 0 0 M E N U S y s t e m C o n f i g u r a t i o n A n a l o g...

Page 103 Press BUZZER key to eliminate the message “Error01 CO2 Gas Empty” and press the left side of cross key for 5 seconds to select cylinder A. Turn the power off. * Refer to Instruction Manual of MCO-19AIC/MCO-19M for the usage of MCO-21GC. - 100 -...

Page 104: How To Install Automatic Co 2 Density Calibration Add-On Kit Mco-Sg

How to install Automatic CO2 density calibration add-on kit MCO-SG Tube joint Clip Parts descriptions Tools Clip Label Plate meeting Filter Tube connect Screw (M4×10) Philips screwdriver Monkey wrench Remove rear cover and sensor BOX Sensor BOX cover. Rear cover Cut 30mm off from the tube and insert tube connect to the place as the left picture specified.

Page 105: Test Data

Test data Following data are the reference only. AT:20 SV:37 CO2 setting: 5% O2 setting: 5% Temperature pull-up data No load Time Hour Humidity pull-up data AT:20 SV:37 CO2 setting: 0% O2 setting: 20% No load Time Hour AT:20 SV:37 Temperature change during power failure CO2 setting: 5% O2 setting: 5%...

Page 106: Temperature Recovery Data (30Sec/60Sec Door Open)

Temperature recovery data AT:20 SV:37 CO2 setting: 5% O2 setting: 5% No load 1 small door 60sec. open 1 small door 30sec. open Time Minutes AT:20 SV:37 CO2 setting: 5% Humidity recovery data O2 setting: 5% No load 30sec. door open 60sec.

Page 107: Days Before Co

AT:20 SV:37 O2 density recovery data CO2 setting: 5%(003MPa) O2 setting: 5%(0.05MPa) No load 1 small door 60sec. open 1 small door 30sec. open Time Minutes Days before CO2 tank becomes empty AT:20 SV:37 CO2 setting: 5% Gas leak: 4.7% per 30min. No load Door open &...

Page 108 - 105 -...

Page 109 Instruction manual This section is extracted and printed from Instruction Manual. If you find out “Refer to page ” in them, this page means not page in Service manual but page in the lower corner of each page in the extract from Instruction Manual. This page number is not corresponded with serial number in Service manual.

Page 110: Instruction Manual

MCO-19M(UVH) INSTRUCTION MANUAL MCO-19M(UV) MCO-19M Multi Gas Incubator - 107 -...

Page 111 CONTENTS INTRODUCTION P. 3 PRECAUTIONS FOR SAFE OPERATION P. 4 LABELS ON THE INCUBATOR P. 8 ENVIRONMENTAL CONDITIONS P. 8 INCUBATOR COMPONENTS P. 9 Control panel and keypad P. 12 Remote alarm terminals P. 13 INSTALLATION SITE P. 14 INSTALLATION P.

Page 112 CONTENTS SPECIFICATIONS P. 74 PERFORMANCE P. 75 SAFETY CHECK SHEET P. 76 - 109 -...

Page 113: Introduction

The contents of this manual are subject to change without notice for improvement of performance or functions. Contact a Sanyo sales representative or agent if any page of the manual is lost or the page order is incorrect. Contact a Sanyo sales representative or agent if any point in this manual is unclear or if there are any inaccuracies.

Page 114: Precautions For Safe Operation

PRECAUTIONS FOR SAFE OPERATION It is imperative that the user complies with this manual as it contains important safety advice. Items and procedures are described so that you can use this unit correctly and safely. If the precautions advised are followed, this will prevent possible injury to the user and any other person.

Page 115 WARNING Do not use the unit outdoors. Current leakage or electric shock may result if the unit is exposed to rain water. Only qualified engineers or service personnel should install the unit. The installation by unqualified personnel may cause electric shock or fire. Install the unit on a sturdy floor and take an adequate precaution to prevent the unit from turning over.

Page 116 The disposal of the unit should be accomplished by appropriate personnel. Remove doors to prevent accidents such as suffocation. Do not put the packing plastic bag within reach of children as suffocation may result. Use the reagent specified by Sanyo for H decontamination. Using a different H solution may result in explosion or damage to the Incubator.

Page 117 Perform H decontamination with the chamber attachments arranged as specified by Sanyo. Arranging them in a different way may result in insufficient decontamination. After H...

Page 118: Labels On The Incubator

LABELS ON THE INCUBATOR Warning and caution labels are attached to the Incubator. The following table describes the labels. This label is attached to covers that access high-voltage electrical components to prevent electric shock. Only a qualified engineer or service personnel should be allowed to open these covers.

Page 119: Incubator Components

INCUBATOR COMPONENTS Handles 10(inside) 16, 17(inside) For MCO-19M(UVH)/19M(UV) or when MCO-19UVS is installed. Handles For MCO-19M(UVH)/19M(UV) or when MCO-19UVS is installed. Rear Right Side Rear Left Side - 116 -...

Page 120 Refer to page 48 for details. 16. UV lamp*: This Sanyo UV lamp does not generate ozone. Never look directly at the UV light. For replacement, contact a Sanyo representative or agent.

Page 121 Decontamination Kit (MCO-HL). This kit must be attached to perform H decontamination. Refer to the installation procedure for MCO-HL for details. 25. Gas injection nozzle * MCO-19M(UVH)/19M(UV) or when an optional UV System Kit (MCO-19UVS) is installed.* - 118 -...

Page 122: Control Panel And Keypad

Refer to page 49 for details. buzzer for an upper limit temperature alarm. ※ The following optional components must be installed to perform decontamination. □UV Lamp Add-on Kit

(MCO-19UVS) (This is provided as standard equipment for the MCO-19M(UV).) Decontamination Kit (MCO-HL) □H Generator (MCO-HP) □H...

Page 123: Remote Alarm Terminals

Remote alarm terminal The remote alarm terminal is located at the rear right side of the incubator. Remote alarm terminal The alarm is outputted from this terminal. Contact capacity is DC 30 V, 2 A. Contact output: between COM. and N.O. between COM.

Page 124: Installation Site

INSTALLATION SITE For correct operation of the Incubator, install it in a location with the following conditions. WARNING When using CO gas for control, make sure that there is adequate ventilation. Using CO gas in a small room without adequate ventilation may cause gas poisoning or oxygen deprivation. In addition, when opening the Incubator doors, do not directly inhale the air in the chamber.

Page 125: Installation

INSTALLATION 1. Remove the packing tape and clean up. Remove all the tape that is securing the doors and inner attachments. Open the doors for ventilation. If the outer panels are dirty, dampen a cloth with a diluted neutral detergent and wipe them. (Using an undiluted solution may damage the plastic.

Page 126: Connection Of Co 2 Gas Cylinder

1. Use a liquefied CO gas cylinder (at least 99.5% pure). The siphon (dip tube) type cannot be used. 2. Install the Gas Pressure Regulator (MCO-100L, purchased separately) specified by Sanyo on the CO gas cylinder. Otherwise, use a CO...

Page 127: Connection Of N 2 (Or O 2) Gas Cylinder

Connection of N (or O) gas cylinder WARNING Check the gas type and ensure that it is fit for the purpose. Make sure that all pipes are connected correctly and are not liable to become disconnected. Ensure that the gas pressure is set at the specified value.

Page 128: Connection Of Gas Injection Nozzle

Connection of gas injection nozzle In the case of control of O density in the chamber, connect the gas injection nozzle to the gas injection port by using the connecting pipe enclosed (inner diameter; 5 mm, outer diameter; 9 mm, length; 400 mm).

Page 129: Preventing Contamination

PREVENTING CONTAMINATION To prevent contamination of the chamber, select a suitable installation site. Avoid locations with high temperatures or humidity. Avoid locations with high temperatures or humidity, because of a greater presence of microorganisms in the air. Avoid locations with passers-by or drafts. Avoid locations near doors, air conditioners, fans, etc., where passers-by or drafts can facilitate the entry of microorganisms into the chamber.

Page 130: Precautions For Cultures

Always open and close the doors gently. Closing the doors forcefully may cause spillage of the culture medium, incomplete closing, or damage to the gasket. Before opening the inner door, check through the glass to confirm that the UV lamp is OFF (if the MCO-19M(UVH)/19M(UV) or the optional MCO-19UVS is installed).

Page 131: Using The Unlock Key

Using the Unlock Key Unlocking when power is interrupted If power is interrupted to the MCO-19M(UVH)/19M(UV) with an MCO-HL installed, the outer door is electrically locked. To unlock the outer door while the power is interrupted, use the unlock key that is provided.

Page 132: Lcd Panel

LCD PANEL The following display (called the Top Display) will appear when the power switch is turned ON. The default temperature is 37.0 C, the default CO density is 0% and the default O density is 20%. The date and time are preset at the factory. Refer to page 38 to change the date and time. T e m p 3 7 .

Page 133 9. Status display field Various status or alarms are displayed. When UV lamp is lit: “UV” is displayed in reverse video. (If the MCO-19M(UVH)/19M(UV) or the optional MCO-19UVS is installed). When humidifying water is low: “RH PAN” is displayed in reverse video and blinks.

Page 134: Basic Operations On Control Panel

Setting UV parameters ON/OFF parameters and the ON period of the UV lamp can be set for the MCO-19M(UVH)/19M(UV) or when the Incubator is equipped with the optional MCO-19UVS (page 36). Setting other parameters The initial settings of the date, time, and log cycle (page 38), and the LCD display and baud rate (page 40) can be set.

Page 135: Basic Parameters

BASIC PARAMETERS Setting the chamber temperature, CO and O density The setting procedure for the chamber temperature, CO and O density are given below. (Default settings: Chamber temperature: 37 C, CO density: 0%, O density: 20%) The Incubator automatically starts operation using these settings after the power is turned ON. 1.

Page 136: Setting The Key Lock

Setting the key lock 1. To set the key lock, change the value of the key lock parameter from 0 to 1 on the Stand-by Setting Display and press the ENTER Key. The buzzer will sound briefly and the keys will be locked. S t a n d - b y S e t t i n g M E N U...

Page 137: Releasing The Key Lock

Releasing the key lock 1. To remove the key lock, change the value of the key lock parameter from 1 to 0 on the Stand-by Setting Display and press the ENTER Key. S t a n d - b y S e t t i n g K e y L o c k...

Page 138: Setting The Key Lock Password

Setting the key lock password 1. From the Top Display, press the MENU Key to display the menu, select Tools, and press the ENTER Key. T e m p 3 7 . 0 C O 2 5 . 0 % 5 .

Page 139 P a s s w o r d Note: Be careful not to forget the key lock password. If you have forgotten the password and cannot release the key lock, contact a Sanyo sales representative or agent. - 136 -...

Page 140 Automatic N (or O) gas cylinder changeover This incubator switches the gas supply lines when one N (or O) gas cylinder becomes empty. Note: An automatic switcher for the CO gas supply lines (MCO-21GC) is available as an optional accessory.

Page 141 6. When gas cylinder A is switched to B, remove gas cylinder A and replace it with new one. Note: Be careful when handling the empty N (or O) gas cylinder. Some gas may still be left in the cylinder.

Page 142: Setting The Upper Limit Alarm Temperature

Setting the upper limit alarm temperature An upper limit temperature alarm is provided with the Incubator. The alarm temperature can be changed by using the following procedure. 1. In the Stand-by Setting Display, turn the upper limit regulator on the control panel using a small screwdriver to set the desired upper limit alarm temperature.

Page 143: Alarm Parameters

ALARM PARAMETERS 1. Press the MENU Key from the Top Display to display the menu, select Tools, and press the ENTER Key. T e m p 3 7 . 0 C O 2 5 . 0 % 5 . 0 % M E N U ...

Page 144: Uv Lamp Parameters

UV lamp. When replacing the UV lamp, replace the glow starter (type FG-7P) at the same time. Consult a Sanyo sales representative or agent for information on replacing the UV lamp. If the UV lamp burns out (Err18:UV Lamp Abnormal will be displayed in the message display field), it will not be possible to perform H decontamination.

Page 145: Precautions When Using The Uv Lamp

Precautions when using the UV lamp WARNING Do not look directly at UV light. UV light is harmful to the eyes. Always use the humidifying pan and humidifying pan cover. The humidifying pan and cover prevent UV light from escaping. Always use them even when not humidifying.

Page 146: Setting The Uv Lamp On Period

Setting the UV lamp ON period Use the following procedure to change the setting of the UV lamp ON period. 1. Press the MENU Key from the Top Display to display the menu, select Tools, and press the ENTER Key. T e m p 3 7 .

Page 147: Lighting The Uv Lamp For 24 Hours

It will also shorten the service life of the UV lamp. When replacing the UV lamp, consult with a Sanyo representative or agent. Note: To compensate for the drop in UV ray output along with increased accumulated ON time of UV lamp, the Incubator automatically extends the UV lamp ON time according to the accumulated ON time.

Page 148: Other Parameters

OTHER PARAMETERS Setting the date, time, and log interval 1. Press the MENU Key from the Top Display to display the menu, select Tools and press the ENTER Key. T e m p 3 7 . 0 C O 2 5 .

Page 149 3. The Date Time Display will appear. Set the date, time and log interval. D a t e T i m e D a t e 1 0 / 1 0 / 0 1 (Y Y / M M / D D) T i m e 1 0 : 0 5 : 0 0 (h h □...

Page 150: Initial Settings (Lcd/Daq Parameters)

DAQ is an external monitoring system of the chamber status. It is necessary to set the DAQ speed, DAQ ID, and DAQ mode to use the optional communications software. Communications software is an optional accessory. Contact a Sanyo sales representative or agent for details. - 147 -...

Page 151: Displaying The Log

DISPLAYING THE LOG A log of the past chamber temperatures, CO densities and O densities can be displayed on a graph. 1. Press the MENU Key from the Top Display to display the menu, select Log and press the ENTER Key. T e m p 3 7 .

Page 152 2. The log will be displayed with dots. Press the Up Cursor Key and Down Cursor Key to switch between the temperature, CO density and O density displays. Press the Left Cursor Key and Right Cursor Key to scroll the displayed data (Left Cursor Key: older data, Right Cursor Key: newer data). Temperature 5 0 °...

Page 153: Transferring Data

HyperTerminal to start the HyperTerminal. (If the HyperTerminal is not available from the Start Menu, execute the following file: C:¥Program Files¥Windows NT¥hypertrm.exe.) 2. In the HyperTerminal Window, set a new connection, the name (for example, Sanyo), connection settings, method of connection, COM1, properties of COM1, and port.

Page 154: Water Level Sensor

WATER LEVEL SENSOR This Incubator is equipped with a water level sensor for the humidifying pan. The sensor is set automatically when the humidifying pan is installed. Take care not to damage the sensor when removing or installing the humidifying pan. When the humidifying pan is removed (side view) Sensor When the humidifying pan is installed (side view)

Page 155: Routine Maintenance

Be careful not to damage the humidifying pan water level sensor or the UV lamp in the chamber duct (if the MCO-19M(UVH)/19M(UV) or the optional MCO-19UVS is installed). Do not use detergents or antiseptic solutions with acid, alkali, or chlorine. Doing so may cause discoloration, corrosion, or rusting.

Page 156 5. Pull out the N gas injection nozzle and N gas injection nozzle tube. (See Fig. 4.) 6. Pull out the humidifying pan. (See Fig. 5.) 7. Loosen the two screws securing the fan cover and take off the fan cover. (See Fig. 6.) Gas injection nozzle tube Fan cover Gas injection

nozzle...

Page 157 12. Clean all the attachments with a diluted neutral detergent, and then rinse them thoroughly with distilled water. 13. Wipe the trays, the inner attachments such as the chamber circulation fan, and the chamber sides with sterilizing alcohol. Be careful not to leave any residual alcohol. 14.

Page 158: Filling The Humidifying Pan

Filling the humidifying pan Use the following procedure to fill the humidifying pan or to replace the water. 1. Lift the humidifying pan cover. (See Fig. 1.) 2. Pull the humidifying pan forward. (See Fig. 2.) 3. Dispose of the remaining water in the pan and clean the pan with a neutral dishwashing detergent.

Page 159: H 2 O 2 Decontamination

The following products must be purchased separately in order to perform H decontamination. Before performing H decontamination, check to make sure that these are correctly installed. UV Lamp Expansion Kit (MCO-19UVS) (Not required for the MCO-19M(UV).) Decontamination Kit (MCO-HL) Generator (MCO-HP) The H decontamination function decontaminates the chamber and the inner attachments.

Page 160 CAUTION Perform H decontamination with the chamber attachments arranged as specified by Sanyo. Arranging them in a different way may result in insufficient decontamination. CAUTION Wear rubber gloves when handling the H reagent. Direct contact with the H reagent may result in inflammation of the skin.

Page 161: H 2 O 2 Decontamination

decontamination Use the following procedure to perform H decontamination using the H Generator (MCO-HP). 1. Take out all trays, tray supports, side supports, the humidifying pan cover, the N or O gas injection nozzle, the N or O gas injection nozzle tube, the humidifying pan, the fan cover, and the duct from the chamber.

Page 162 6. Press the H Key for 3 seconds. The system check will start. H 2 O 2 D e c o n t a m i n a t i o n H 2 O 2 D e c o n S y s t e m C h e c k □...

Page 163 9. After completion of H mist generation, “UV Resolve” will flash at the top of the screen, and H resolution by UV light will start. H 2 O 2 D e c o n R e s o l v e S t e p : 7 □□...

Page 164: Precautions When Handling H

12. Dilute the remaining H reagent in the H Generator with a large volume of water and dispose of it. Rinse and wash the H Generator with distilled water. Then keep the H Generator in a clean environment outside of the chamber. Note: After H decontamination, cover the connector on the chamber side with the connector cap.

Page 165: Alarms, Safety, And Self-Diagnosis

ALARMS, SAFETY, AND SELF-DIAGNOSIS The Incubator supports the following alarms, safety functions, and self-diagnostic functions. Table 1: Alarms and Safety Functions for Culture Operations Alarm or safety Conditions Display Buzzer Safety operation function Upper limit Heater OFF The chamber temperature exceeds the temperature OVERHEAT indicator lights.

Page 166) gas cylinder is correctly connected to a connecting port A/B for gas pipe. Refer to page 17 If an error from Err05 to Err19 occurs (except for the upper limit temperature alarm in Err13 to Err16), then consult a Sanyo sales representative or agent. - 163 -...

Page 167 Table 2: Alarm and Safety Functions for H Decontamination Alarm and safety Condition Display Buzzer Safety operation function H2O2 Decon System Error is displayed The H Generator is not in the screen center. Decontamination mode is ----- connected. Err31:H2O2 Unit No Connect is cancelled.

Page 168: Calibration

CALIBRATION Temperature/CO calibration 1. Press the MENU Key from the Top Display to display the menu, select Tools, and press the ENTER Key. T e m p 3 7 . 0 C O 2 5 . 0 % 5 . 0 % M

E N U ...

Page 169 Example Enter the value shown below if the displayed chamber CO density is 5.0% but the actual CO density is 4.5%. density span: Enter 045. T e m p / C O 2 / O 2 C a l i b r a t i o n V o l t T e m p S p a n...

Page 170: Troubleshooting

TROUBLESHOOTING If the Incubator does not seem to be working properly, check the following items before calling for service. Symptom Items to check and countermeasures Is the Incubator plugged in? The Incubator does not operate at all. Is there a power outage, or has a circuit breaker interrupted the power? Is the key lock function turned OFF? The key is not working.

Page 171 If the MCO-19M(UV)/19M is being used, is the optional MCO-HL decontamination cannot be installed? performed. If the MCO-19M is being used, are the optional MCO-HL and MCO-19UVS installed? Is the UV lamp burned out? If the UV lamp is burned out, H decontamination will not be possible.

Page 172: Disposing Of The Multi-Gas Incubator

DISPOSING OF THE MULTI-GAS INCUBATOR When disposing of the multi-gas incubator, contact a Sanyo sales representative or agent. WARNING The incubator must be dismantled and disposed of by qualified personnel only. If the incubator is left where outsiders enter, it may result unexpected accident (for example, children to become locked inside).

Page 173 Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC (English) This SANYO product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol means that the electrical and electronic equipment, at their end-of-life, should be disposed of separately from household wastes.

Page 174 (French) Votre produit Sanyo est conçu et fabriqué avec des matèriels et des composants de qualité supérieure qui peuvent être recyclés et réutilisés. Ce symbole signifie que les équipements électriques et électroniques en fin de vie doivent être éliminés séparément des ordures ménagères.

Page 175 Por favor, ajude-nos a conservar o ambiente em que vivemos! (Italian) Il vostro prodotto SANYO è stato costruito da materiali e componenti di alta qualità, che sono riutilizzabili o riciclabili. Prodotti elettrici ed elettronici portando questo simbolo alla fine dell'uso devono essere smaltiti separatamente dai rifiuti casalinghi.

Page 176 Alstublieft help allen mee om het milieu te beschermen. (Swedish) Din SANYO produkt är designad och tillverkad av material och komponenter med hög kvalitet som kan återvinnas och återanvändas. Denna symbol betyder att elektriska och elektroniska produkter, efter slutanvändande, skall sorteras och lämnas separat från Ditt hushållsavfall.

Page 177: Automatic Co 2 Cylinder Changeover

AUTOMATIC CO CYLINDER CHANGEOVER An automatic CO cylinder changeover system (MCO-21GC) is available as an optional accessory. This system switches the gas supply lines when one CO gas cylinder becomes empty. Note: The installation of the MCO-21GC must be performed only by qualified service personnel. Install the MCO-21GC and then perform the following procedure 1.

Page 178 6. When gas cylinder A is switched to B, remove gas cylinder A and replace it with new one. Note: Be careful when handling the empty CO gas cylinder. Some gas may still be left in the cylinder. When gas cylinder B becomes empty, the line is switched to gas cylinder A again. The MCO-21GC detects that there is no more CO gas in a cylinder when the CO density in the chamber...

Page 179: And O 2 Density Calibration

AUTOMATIC CO AND O DENSITY CALIBRATION To calibrate the CO and O density, a Semi-automatic one point Gas Calibration Kit (MCO-SG) is available. By connecting a standard gas cylinder that has a density that is the same as the set CO and O density (usually 5% CO...

Page 180 3. Input the CO and O density of standard gas to be used, press the MENU Key to display the menu, select OK, and press the ENTER Key. S t a n d a r d G a s S e t t i n g M E N U

S t d G a s...

Page 181 3. If the system is normal, the following display will appear. Select OK and press the ENTER Key to start calibrating the CO and O density. After calibration, return to normal cultivating operation. S t a n d a r d G a s C a l i b r a t i o n S t e p ...

Page 182: Stacking Incubators

STACKING INCUBATORS Use the following procedure to stack Incubators. This work is potentially dangerous, so contact a Sanyo representative or agent. CAUTION Select a floor that is strong enough to support the stacked incubators. Never stack three or more incubators. Doing so is dangerous.

Page 183 Front panel Stacking plate B Front Stacking plate A Protective sticker Hook Fig.A - 180 -...

Page 184 SPECIFICATIONS Name Multi-gas Incubator Models MCO-19M MCO-19M(UV) MCO-19M(UVH) External dimensions W620 x D710 x H900 mm (W24.4 x D28.0 x H35.4 inch) Internal dimensions W490 x D523 x H665 mm (W19.3 x D20.6 x H26.2 inch) Interior volume 162 L (5.72 cu.ft.)

Page 185 Stacking spacer (MCO-18SB, when stacking on the MCO-175), Stacking spacer (MCO-21SB, when stacking on the MCO-20AIC) Ethernet (LAN) Interface (MTR-L03), RS232C/RS485 Interface (MTR-480) SANYO Data acquisition software (MTR-5000) 4-20mA Interface (MCO-420MA, USA only) Note: Designs and specifications are subject to change without notice.

Page 186 Procedure to be adhered to in order to reduce safety risk indicated in b) below. Date : Signature : Address, Division : Telephone : Product name : Model : Serial number : Date of Installation : Multi-gas incubator MCO-19M(UVH) MCO-19M(UV) MCO-19M Please decontaminate the unit yourself before calling the service engineer. - 183 -...

Page 187 DC3186-150B SANYO Electric Co., Ltd Printed in Japan...

This manual is also suitable for:

Mco-19m(uv)